

Amendments to the Specification:

Page 1, please replace the paragraph that starts in line 5 with the following new paragraph:

This is a continuation of U.S. Serial No. 10/195,025 filed July 11, 2002, which in turn is a continuation of U.S. Serial No. 09/446,671 filed December 20, 1999, now U.S. Patent No. 6,443,622 issued September 3, 2002, which in turn is the U.S. National Phase application of International Application PCT/GB98/01823 filed June 22, 1998, designating the U.S., which in turn is based on British Serial No. 9713343.3 filed June 24, 1997.

Pages 5 and 6, please replace the paragraph that starts in line 25 on page 5 and ends in line 15 on page 6 with the following new paragraph:

The bearing 6 includes (Fig. 1) an inner race in the form of two cones 26 which fit around the spindle 14 where they are captured between the shoulder 18 and the formed end 20, there being an interference fit between each cone 26 and the spindle 14. The cones 26 define a component having a cylindrical opening 27 therethrough, and the spindle end portion is received through the opening. Each cone 26 has a tapered raceway 28 that is presented outwardly away from the axis X, a thrust rib 30 at the large end of its raceway 28, and back or outer end face 32 that is squared off with respect to the axis X on the end of the thrust rib 30. The inboard cone 26 is somewhat longer than the outboard cone 26 by reason of a cylindrical cone extension 34 which projects beyond the small end of its raceway 28. The inboard cone 26 at its cone extension 34 abuts the small end of the outboard cone 26 along the spindle 14, that is to say, the two cones 26 abut their front faces. The back or outer end face 32 of the outboard cone 26 abuts the shoulder 18 that lies immediately inwardly from the flange 10. The formed end 20 outwardly beyond the

inboard cone 26 and lies against the back or outer end face 32 of that cone. Thus, the two cones 26 are captured on the spindle 14 between the shoulder 18 and the formed end 20. The two cones 26 abut their opposite ends, that is at their front faces, so that the extension 34 lies between the raceways 28 out of the two cones 26.

Pages 8 and 9, please replace the paragraph that begins with line 24 on page 8 and ends with line 5 on page 9 with the following amended paragraph:

The hub 2 does not always have the formed end 20. Initially, it exists as a pre-form 70 (Fig. 4), which is the condition in which it is forged and then machined. In the pre-form 70 the spindle 14 is straight, that is to say, its cylindrical exterior surface 15 continues axially to the very end of the spindle 14. The component defined by the two cones 26, the rollers 36 of the two rows, and housing 4, which is captured by the rollers 36, are all installed over the straight spindle 14 of the pre-form 70, leaving ~~[[an]]~~ a deformable annular end portion 71 of the spindle 14 projecting beyond the inboard cone 26. Thereupon, the projecting deformable annular end portion 71 is deformed radially outwardly and axially into the formed end 20 in a rotary forming operation (Fig. 7).

Page 9, please replace the paragraph from line 6 to line 12 with the following amended paragraph:

In the pre-form 70, the deformable annular end portion 71 of the spindle 14 has (Fig. 4) the first beveled surface 68 that leads away from the bore 22. The beveled surface 68 merges into a slightly tapered surface 72 at a corner or circle C of transition. The slightly tapered surface 72 merges into another tapered surface 74 that leads ~~[[of]]~~ away from the bore 22 at a

greater angle than the slightly tapered surface 72. The steeper tapered surface 74 leads out to a flat end surface 78 with which it merges at a curved surface 80. The flat end surface 78 at its periphery has a chamfer 82. Thus, the deformable annular end portion 71 has a cylindrical outer surface 71a and a tapered inner surface 72, 74 that tapers outwardly away from the spindle rotational axis toward the outer end 78 so that the deformable annular end portion 71 decreases in radial thickness along its length from its intersection C with the inner beveled surface 68 in a direction toward its outer end 78.

Page 9, please replace the paragraph from line 13 to line 19 with the following amended paragraph:

[[That]] The deformable annular end portion 71 of the pre-form 70 initially projects beyond the back or outer end face 32 of the component defined by the inboard cone 26 without change in its external diameter, but is thereafter transformed into the formed end 20 in a rotary forming procedure. (Fig. 7). In this procedure the metal of the deformable annular end portion 71 flows radially and axially, all without acquiring cracks, and ultimately assumes the configuration of the formed end 20. The transformation occurs in a rotary forming machine B. Outward deformation of the deformable annular end portion 71 is such that the tapered inner surface 72, 74 is outwardly deformed along its length from adjacent its intersection C with the inner beveled surface 68 to its outer end 78.

Page 9, ahead of line 20, please insert the following new paragraphs:

The pre-form shape of Fig. 4 is deformed and worked into the shape of the formed end 20 in Fig. 3. The deformable annular end portion 71 is deformed generally radially outwardly and

axially to have its outer cylindrical surface 71a become the end face 58 of the formed end 20.
The inner end face 58 engages the outer end face 32 of the component 26.

Deformation of the deformable annular end portion 71 generally radially outwardly and axially is also done in a manner that provides the resulting formed end 20 with a peripheral outside corner 64 that is located closely adjacent the outer end face 32 of the component 26.

Deformable annular end portion 71 is deformed generally radially outwardly and axially so that both its outer end 78 and at least a portion of its tapered inner surface 72, 74 are worked and reformed into a single curved outside end surface 60 on the formed end 20. The curved outside end surface 60 faces outwardly generally axially of the spindle axis and curves smoothly along its entire length toward the spindle rotational axis from the peripheral outside corner 64 of the formed end 20 that is located closely adjacent the outer end face 32 of the component.

The curved outer end surface 60 on the formed end 20 curves from the peripheral outside corner of the formed end 20 adjacent the outer end face 32 of the component 26 in directions both axially outwardly and radially inwardly toward the spindle rotational axis so that a point traveling along the curved outer surface 60 moves both axially outwardly and radially inwardly of the spindle axis and the thickness of the formed end 20 in a direction axially of the spindle rotational axis gradually increases along its length generally radially of the spindle rotational axis in a direction from the peripheral outside corner 64 adjacent the outer end face 32 of the component 26 toward the spindle rotational axis. In the arrangement shown in Fig. 3, the curved outside end surface merges into a generally flat outside end surface 62.

Page 14, please replace the paragraph that begins in line 10 and ends in line 22 with the following amended paragraph:

The configuration of the extended deformable annular end portion 71 of the pre-form 70, the distance it projects beyond the back or outer end face 32 of the component defined by the inboard cone 26, and the advance imparted to the table 92 by the ram 98 are all such that the formed end 20 does not deform the inboard cone 26 or impart excessive preload to the bearing 6. For example, if the deformable annular end portion 71 of the pre-form 70 extends too far beyond the back or outer face 32 of the inboard cone 26 or otherwise contains excessive material in that region, the space between the forming tool and the cone back or outer face 32 cannot accommodate all of the material, and the inboard cone 26 undergoes distortion in the region of its thrust rib 30 and raceway 28. Likewise, if the dwell height of the ram 98 is too high, again inadequate space exists to contain the metal which flows along the cone back or outer face 32 and the cone 26 will experience distortion.

Page 15, please replace the paragraph that begins in line 5 and ends in line 12 with the following amended paragraph:

The force registered by the load cell in the ram 98 also serves to identify bearing assemblies that require rejection. In this regard, excessive force exerted by the ram indicates an error in the geometry of the pre-form [[71]] 70 or perhaps, an error in setting up the machine B. In any event, excessive force exerted by the ram 98 may distort the inboard cone 26, causing permanent damage to the bearing assembly A. For a hub 2 having a spindle 14 with a 45 mm outside diameter, a ram force exceeding 10 to 12 tonnes signals a possible defect.